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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/032,056	12/31/2001	Byeong-Dae Choi	053785-5045	5637

9629 7590 06/16/2006

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EXAMINER

WARREN, MATTHEW E

ART UNIT	PAPER NUMBER
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2815

DATE MAILED: 06/16/2006

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**BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES**

Application Number: 10/032,056
Filing Date: December 31, 2001
Appellant(s): CHOI, BYEONG-DAE

Mary Jane Boswell
For Appellant

EXAMINER'S ANSWER

This is in response to the appeal brief filed March 22, 2006 appealing from the Final Office action mailed August 31, 2005.

(1) Real Party in Interest

A statement identifying by name the real party in interest is contained in the brief.

(2) Related Appeals and Interferences

The examiner is not aware of any related appeals, interferences, or judicial proceedings which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

(3) Status of Claims

The statement of the status of claims contained in the brief is correct.

(4) Status of Amendments After Final

The appellant's statement of the status of amendments after final rejection contained in the brief is correct.

(5) Summary of Claimed Subject Matter

The summary of claimed subject matter contained in the brief is correct.

(6) Grounds of Rejection to be Reviewed on Appeal

The appellant's statement of the grounds of rejection to be reviewed on appeal is correct.

(7) Claims Appendix

The copy of the appealed claims contained in the Appendix to the brief is correct.

(8) Evidence Relied Upon

US 5,162,933

Kakuda et al.

11-1992

(9) Grounds of Rejection

The following ground(s) of rejection are applicable to the appealed claims:

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over the Applicant's Prior Art Figures 2 and 3F (APAF) in view of Kakuda et al. (US 5,162,933).

In re claim 1, APAF 2 and 3F show an array substrate for a liquid crystal display device, comprising a substrate (22) a plurality of gate lines (25) arranged transversely on the substrate; a plurality of data lines (27) disposed orthogonal to the plurality of gate lines. A plurality of thin film transistors is formed on the substrate adjacent to intersections of the gate lines and the data lines. Each thin film transistor includes a gate electrode (32), a gate insulation layer (41), an active layer (45), an ohmic contact

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layer (47), a source electrode (33) and a drain electrode (35). A plurality of pixel electrodes (17) are disposed at pixel regions (P) defined by the intersections of the gate lines and the data lines wherein each pixel electrode connected to a corresponding one of the drain electrodes. A metal layer (28) is formed at peripheral portions of the drain electrode to extend from the pixel electrode. The APAF shows all of the elements of the claim except the metal layer formed on an entire surface of each of the data lines.

Kakuda et al. shows (figs. 3 and 4) an LCD device having data line 11a with a metal layer 11b formed on the entire surface (col. 4, lines 45-49). With such a configuration, the materials of the data line provide a light blocking function, have good heat resistance, may lower the electrical resistance, and help simplify the manufacturing process because the data line can be formed simultaneously with the pixel electrode (col. 6, line 61 – col. 7, line 29). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the data line of the APAF by forming a metal layer on the entire data line as taught by Kakuda to provide a light blocking data line having good heat resistance, a specified electrical resistance, and a reduced manufacturing steps.

In re claims 2 and 11, the APAF shows (fig. 3B) that the gate insulation layer (41) is disposed on the gate electrode or a plurality of gate electrodes as shown in figure 2.

In re claim 3, the APAF shows (fig. 3B) that the active layer (45) is disposed on the gate insulation layer, and the ohmic contact layer (47) is disposed on the active layer.

In re claim 4, the APAF (fig. 3F) shows that the source electrode (33) and the drain electrode (35) are disposed on the ohmic contact layer.

In re claims 5 and 6, the APAF shows (fig. 2) that the source electrode extends from one of the data lines and the drain electrode extends from one of the pixel electrodes.

In re claim 7-10, the APAF discloses [0009] that the drain electrode and source electrode include at least a transparent conductive material (ITO). Each data line includes at least the transparent conductive material (ITO). Each pixel electrode (17) includes the transparent conductive material (ITO). The transparent conductive material is selected from a group including indium tin oxide, indium zinc oxide, zinc oxide, tin oxide, and indium oxide.

In re claim 12, Kakuda discloses (col. 7, lines 8-28) that the materials of the metal layer are selected from the group including Au, Ag, Cu, and Al.

In re claim 14 and 15, the APAF shows (fig. 3F) that the metal layer (28) is formed at peripheral portions of the plurality of pixel electrodes and at peripheral portions of the drain electrode.

(10) Response to Argument

The appellant primarily argues Kakuda cannot be combined with the Applicant's Prior Art Figures 2 and 3F (APAF) because (1) Kakuda does not specifically teach a specific motivation for forming a data line having a metal layer formed on the entire surface; and that (2) Kakuda teaches away from using laminated data line structures.

The examiner disagrees with the appellant's arguments and believes that Kakuda shows proper motivation for the combination.

(1) In re the arguments that Kakuda does not show specific motivation for using laminated data lines having a metal layer formed on the entire surface of the data line, the examiner still asserts that Kakuda shows proper motivation. As stated in the 35 USC 103 Rejection above, Kakuda was cited to cure the deficiencies of the APAF and teach a metal layer formed on an entire surface of the data line. Kakuda describes the invention's benefit as whole in column 6, line 61 through column 7, line 7. From those passages it can be determined that the data lines of the invention have reduced manufacturing steps since Kakuda states (col. 7, lines 4-7) that "simultaneous formation of the windows for the connection of the storage capacitance lines and the windows for the connection of the matrix lines (data lines, scan lines, etc.) of the thin film transistors minimizes the number of manufacturing steps involved and hence keeps down the manufacturing costs." Kakuda also specifically states (col. 7, lines 10-17) that the data lines 11 may be formed of aluminum (Al), tungsten (W), etc. . . . " and that "Aluminum is particularly suitable for the lines 11, 13, and 29 because it is low in electrical resistance, and it is also suitable for light blocking layers 18 because of its high reflectivity to light." Kakuda further goes on to state (col. 7, lines 20-28) that ". . . molybdenum (Mo), though appreciably higher in its electric resistance than aluminum (Al) . . . is excellent in heat resistance" and is employed widely "as a wiring material." Kakuda then goes on to disclose (col. 7, lines 51-55) that ". . . in an

active matrix LCD (liquid crystal display), it is desirable, for the purpose of reducing the resistance of matrix lines, to employ a laminated structure in which an aluminum film overlies the ITO film forming the transparent electrode” As stated in the rejection above, Kakuda specifically teaches that the LCD device has a data line 11a with a metal layer (molybdenum-base alloy) 11b formed on the entire surface (col. 4, lines 45-49). Kakuda may not specifically disclose that the data line itself is “a light blocking data line,” but at the very least Kakuda discloses that the data line is a laminated structure, having a reduced resistance. Because of the materials and manufacturing process of Kakuda, the invention has the additional benefits of having good heat resistance and reduced manufacturing steps. In all, the cited reference teaches the benefits of using a laminated structure in which metal is formed on the entire surface of the data line. Kakuda teaches motivation for combining with the APAF and the combined references show all of the elements of the claims.

(2) In re the arguments that Kakuda teaches away from using laminated data lines structures, the examiner believes that Kakuda does not explicitly teach away from the combination. It is agreed that Kakuda discloses the disadvantages of using aluminum or molybdenum laminated conductive lines, but that does not necessarily mean that Kakuda is teaching away from such usage. If Kakuda were to teach away from the laminated structure, Kakuda would specifically state that the invention does not use the laminated structure at all. In fact, despite the disadvantages, Kakuda still uses the aluminum-molybdenum laminated conductive lines. Even if Kakuda were to specifically

reject the usage of laminated conductive lines in his particular invention, Kakuda still discloses that the use of laminated conductive lines is a well known practice in the art (col. 7, lines 51-59). Kakuda is merely stating that there are known advantages and disadvantages to using aluminum and molybdenum for the laminated structure. The appellant even acknowledges that laminating a data line is a well known practice (see the appellant's brief page 9, 2nd paragraph) by stating that "Kakuda et al. actually discloses the disadvantages of using the known practice of forming laminated conductive lines in LCD devices." Listing disadvantages of the invention does not mean that structure is being taught away from. All materials and products have advantages and disadvantages. Furthermore, a reference teaching away from using a known structure, material, or process does not necessarily mean that the appellant's claimed invention is patentable over the cited art, it just means that the inventive feature of the appellant's claimed invention is known in the art and is not desirable.

In essence, by the appellant's own admission and by the teachings of Kakuda, the asserted novel feature of laminating a data line is not patentably distinguishable over the cited art. Kakuda is properly combined with the APAF and the combined references show all of the elements of the claims.

(11) Related Proceeding(s) Appendix

No decision rendered by a court or the Board is identified by the examiner in the Related Appeals and Interferences section of this examiner's answer.

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

MEW

Mew


June 8, 2006

Conferees:

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KENNETH PARKER
SUPERVISORY PATENT EXAMINER